Preliminary Science Flight Report
Operation IceBridge Antarctica 2011

Flight: **GV-FL10**
Mission: **LVIS-PIG3**

Flight Report Summary

Aircraft	**NSF G-V (N677F)**
Flight Number	10
Flight Request	118003
Date	Sunday October 23rd, 2011, DOY 296
Purpose of Flight	Operation IceBridge Mission, LVIS PIG3
Take off time	13:55 UTC from Punta Arenas (SCCI) on October 23, 2011
Landing time	00:35 UTC at Punta Arenas (SCCI) on October 24, 2011
Flight Hours	10.7
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• High-altitude survey (~41,000 ft pressure altitude) of grid lines • Overflight of Icesat track 0234 • 600 & 900km long sea ice transects in Bellingshausen on transit in/out • Completed mission as planned. • Conducted roll and pitch maneuvers for calibration at start/end of flight
Geographic Keywords	Antarctica, Pine Island Glacier, Bellingshausen Sea, West Antarctic Ice Sheet, WAIS
ICESat/CryoSat Track	Grid lines cross numerous Icesat tracks, ~200 nm along Icesat track 0234
Repeat Mission	Overlap with previous LVIS data, previous IceBridge data at PIG, crossed DC-8 2011 Mission “Bellingshausen1” just hours after DC-8 passed

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
LVIS	☑	☒	☑	55 GB	None
POS/AV (510 + 610)	☑	☑	☑	5 GB	None
LVIScameras(2)	☑	☒	☑	50 GB	None
G-V Onboard Data	☑	☑	☑	10 MB	None

Mission Report (Michelle Hofton, Mission Scientist, Instrument Operators: David Rabine, Bryan Blair)

This LVIS NSF G-V flight surveyed a series of lines along the northern edge of the Pine Island Glacier, and a 350km long segment of ICESat track 0234, as well as data on the transits from the Bellingshausen Sea (~600km transect on the way in, ~900km transect on the return) and over land from the end of the grid lines over the Abbot ice shelf into the Bellinshausen Sea. At PIG, six ~350km long grid lines including one that repeated and extended a line flown as part of the LVIS 2009 IceBridge PIG flight were surveyed. The survey is part of the overall deployment plan to collect grid data over a large region that encompasses the entire Antarctic Peninsula to the Getz Coast.

Weather conditions were very good. Two, long portions of sea ice data in the Bellingshausen Sea were collected on both the transit in and out. The DC-8 flew its Bellingshausen1 track today and we intersected their lines both on the transit in and out (between DC-8 waypoints 104n and 105n) potentially allowing for drift rate estimates to be made using data from the two flights. The over land portion of the transits were almost completely cloud free, including ICEsat track 0234 from the coast to the grid lines. At Pine Island, a low cloud layer from the water to just below the grounding line was present, but only affected the lower 3% of the 6 grid lines. Overall data collected on the PIG-East survey lines was at a > 97% success rate.

The LVIS sensor worked very well. Data was successfully collected over the survey lines and on portions of the transit over land to/from the target area. The camera was operated in cloud free areas.

This is the 9th successful LVIS science flight this year.

Roll and pitch maneuvers were carried out on the transit to/from Antarctica.

Individual instrument reports from experimenters on board the aircraft:

LVIS: The LVIS system worked well.

POS/AV: Systems worked well. No issues.

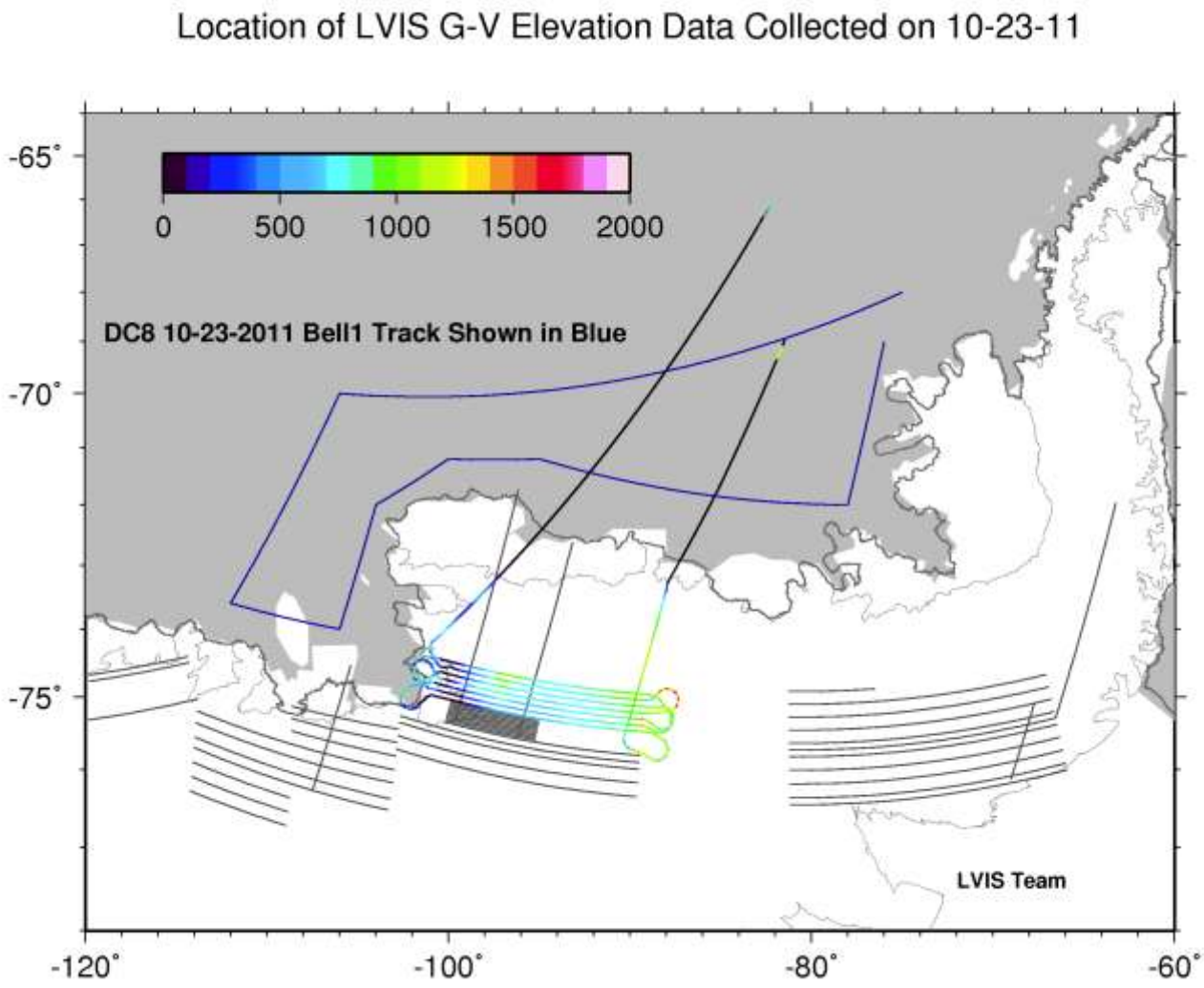
LVIScam: System worked well. No issues.

G-V onboard data: System worked well.

The tongue of Pine Island Glacier from the NSF G-V's unique high-altitude perspective.

The large crack near the front of the glacier is just visible at the left edge of the image, and, in the low cloud bank just off the coast, a line through the clouds can be seen – this feature may have been created when the DC-8 flew through these clouds collecting sea ice data just before we arrived.

Surface elevations mapped during today's flight shown in color below. Elevations were generated using real-time Applanix attitude and trajectory data, combined with the quicklook processing of LVIS data in-flight. Other 2011 LVIS flight lines are shown in gray. The planned track of today's DC-8 Bellingshausen flight (Bell1) is shown in blue.



Flight Hours Summary

Flight	Date	Aircraft Flight #	Data Flight#	Duration (hr)	Running Total(hr)	Remaining Science Hours*
						100.00
PUQ-PUQ	10/07/11	RF01	GV-FL01	10.7	10.7	89.3
PUQ-PUQ	10/08/11	RF02	GV-FL02	10.4	21.1	78.9
PUQ-PUQ	10/10/11	RF03	GV-FL03	10.7	31.8	68.4
PUQ-PUQ	10/12/11	RF04	GV-FL04	10.3	42.1	58.4
PUQ-PMC	10/13/11	FF01	-	1.9		
PMC-PUQ	10/14/11	FF02	-	2.1		
PUQ-PUQ	10/14/11	RF05	GV-FL05	1.4	47.5	52.5
PUQ-PUQ	10/15/11	RF06	GV-FL06	10.5	58.0	42.0
PUQ-PUQ	10/17/11	RF07	GV-FL07	10.9	68.9	31.1
PUQ-PUQ	10/19/11	RF08	GV-FL08	10.5	79.4	20.6
PUQ-PMC	10/20/11	FF03	-	1.9		
PMC-PUQ	10/21/11	FF04	-	2.1		16.6
						+50
PUQ-PUQ	10/22/11	RF09	GV-FL09	10.4	93.8	55.2
PUQ-PUQ	10/23/11	RF10	GV-FL10	10.9	104.7	44.3

* 50 additional mission flight hours added (10/21/11)